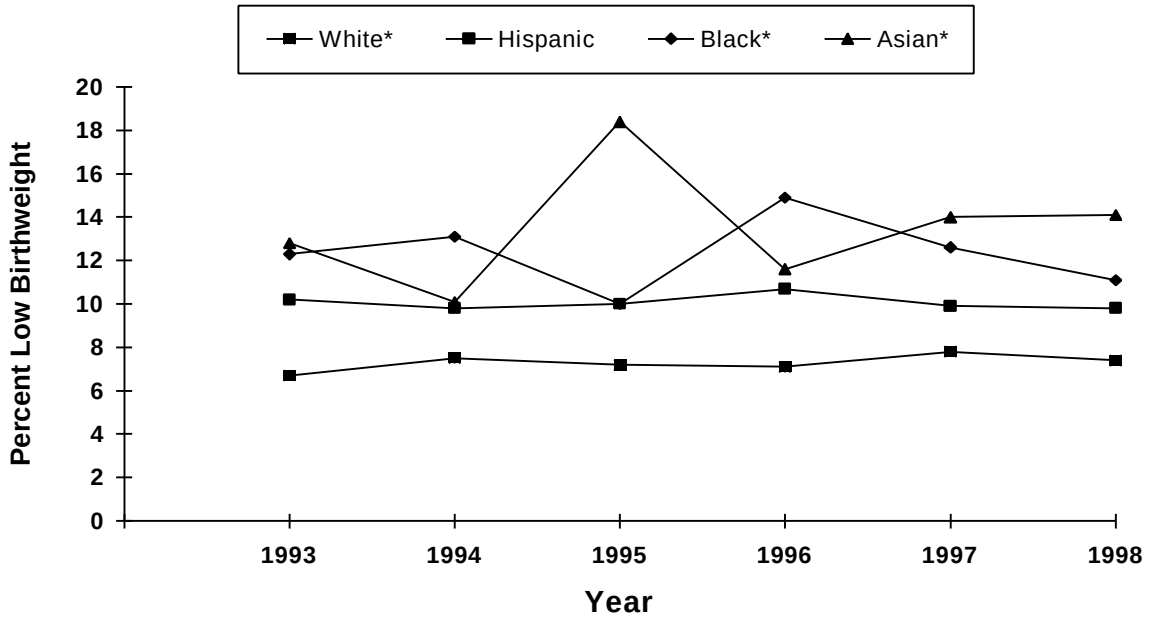
II.

Birth Outcomes and Prenatal Care

Figure 6.

Trends in Percent Low Birthweight[1] among Births to Women under Age 20 by Race/Hispanic Ethnicity
Massachusetts: 1993-1998



	1993	1994	1995	1996	1997	1998
White*	6.7	7.5	7.2	7.1	7.8	7.4
Black*	12.3	13.1	10.0	14.9	12.6	11.1
Hispanic	10.2	9.8	10.0	10.7	9.9	9.8
Asian*	12.8	10.1	18.4	11.6	14.0	14.1
Total	8.6	9.1	8.6	9.4	9.5	8.9

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1993-1998.

* Non-Hispanic

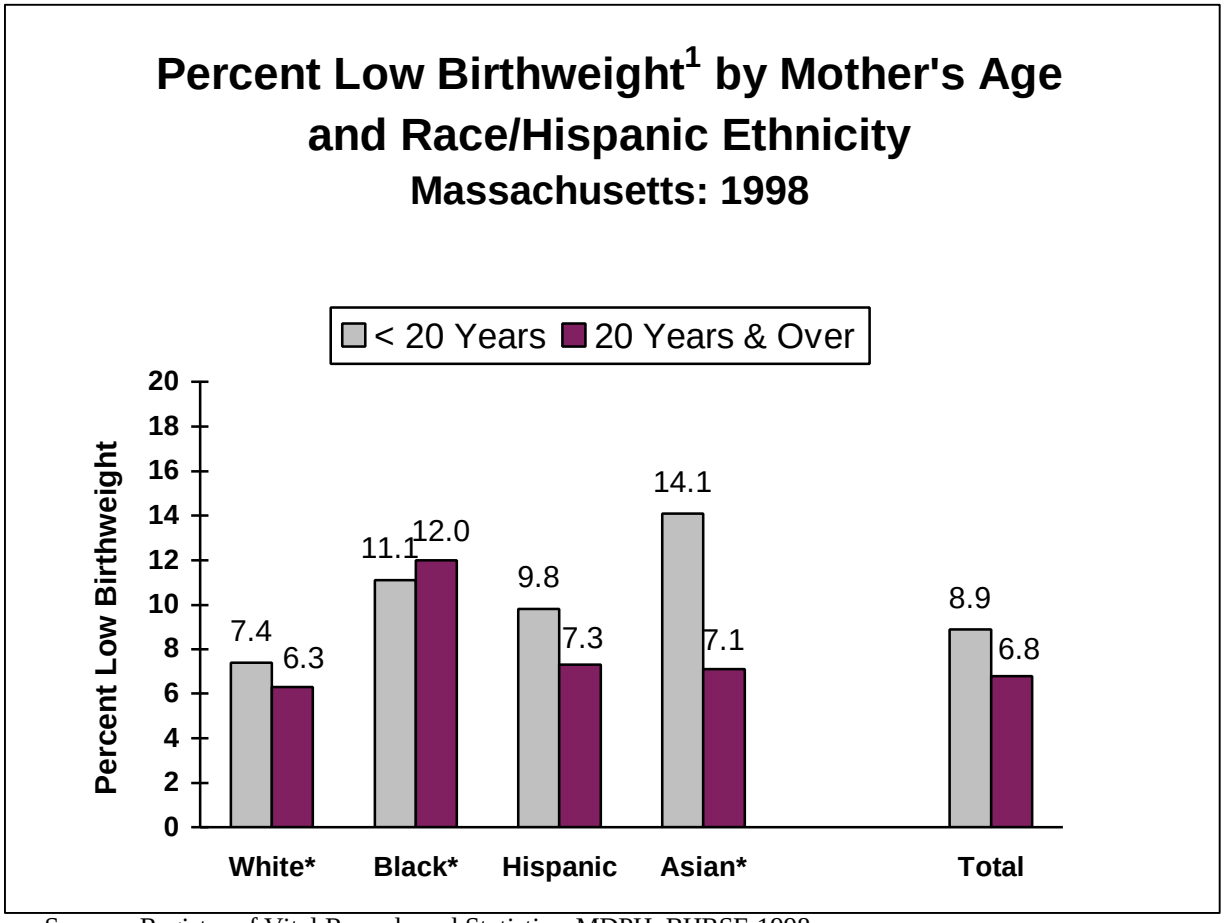
[1] Low birthweight: < 2,500 grams or 5.5 pounds.

- In 1998, the total proportion of low birthweight births (less than 2,500 grams) among births to teens (ages 12-19) was 8.9%, a 6.3% decline from the prior year of 9.5%. The occurrence of low birthweight (LBW) with teens continued to differ across race/Hispanic ethnicity groups, with white non-Hispanic teens having the lowest percentages of LBW at 7.4%.

- In 1996, the widest gap between the percentages of LBW infants born to teens was between births to white non-Hispanic teen mothers (7.1%) and births to black non-Hispanic mothers (14.9%). This gap narrowed by 1998 as a function of an increase in LBW among white non-Hispanic teen births (to 7.4%) and a decrease among black non-Hispanic births (to 11.1%). During the same period, percentage LBW among Hispanic teen births decreased from 10.7% to 9.8%.

- The percentage of LBW births to Asian teen mothers decreased from 18.4% in 1995 to 11.6% in 1996. This percentage remained nearly fixed from 1997 (14.0%) to 1998 (14.1%). *As the number of LBW births is small among Asian teen mothers (n=185), their LBW percentages fluctuate widely and changes over time should be interpreted with caution.*

Figure 7.



Source: Registry of Vital Records and Statistics, MDPH, BHRSE,1998.
* Non-Hispanic
[1] Low birthweight: < 2,500 grams or 5.5 pounds.

- Overall, the percent of low birthweight births among teen births was 30.9% higher than it was for births to adult women (8.9% vs. 6.8%). This ratio varied by race/Hispanic ethnicity. Low birthweight among births to black non-Hispanic teens in 1998 was 7.5% lower than among births to black non-Hispanic adults (11.1% vs. 12.0%). Among all other race and Hispanic ethnicity groups, the low birthweight percentage was higher among teens than among adult women. Low birthweight among white non-Hispanic teens was 17.5% higher than among white non-Hispanic adult women (7.4% vs. 6.3%), while Asian teens had nearly twice as high a percentage of low birthweight births compared with adult Asian women (14.1% vs. 7.1%).

Table 13.
Low Birthweight[1] Births by Mother's Age and Race/Hispanic Ethnicity
Massachusetts: 1998

Mother's Age	White*		Black*		Hispanic		Asian*		Other		Unknown		Total	
	N[2]	%[3]	N[2]	%[3]	N[2]	%[3]	N[2]	%[3]	N[2]	%[3]	N[2]	%[3]	N[2]	%[3]
All Ages[4]	3,918	6.4	657	11.8	674	7.8	280	7.5	121	7.9	5	7.4	5,655	6.9
20 +	3,701	6.3	574	12.0	500	7.3	254	7.1	98	7.6	5	7.6	5,132	6.8
< 20	217	7.4	83	11.1	174	9.8	26	14.1	23	9.7	0	0.0	523	8.9
<18	65	7.5	37	12.3	84	11.0	10	16.7	9	13.2	0	0.0	216	10.1
18-19	152	7.3	46	10.4	90	8.9	16	11.2	14	6.8	0	0.0	307	8.1
15-17	63	7.5	33	11.5	78	10.8	16	17.2	14	13.7	0	0.0	201	10.0
<15	2	**	4	**	6	14.6	0	0.0	0	0.0	0	0.0	12	15.2

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

* Non-Hispanic

** Calculations based on fewer than five events are excluded.

1 Low birthweight: < 2,500 grams or 5.5 pounds.

2 "N" is the total number of low birthweight births in each category.

3 Percentages are based on the total number of births in each category for which birthweight is known.

4 "All Ages" includes mothers of unknown age.

- Low birthweight births varied with maternal age, with the highest percentage overall occurring among the infants of women less than 15 years old (15.2%), and the lowest occurring among births to women ages 20 and older (6.8%). The occurrence of low birthweight births among women under 20 was 30.9% higher than it was for births to women 20 and over (8.9% vs. 6.8%)

- Low birthweight varied by race/Hispanic ethnicity, as Hispanic women among both teen (<20 years of age) and older mothers (20 years and older) were more likely, 32% and 15.9% respectively, to deliver a LBW infant than their white non-Hispanic counterparts. The proportion of LBW births to black non-Hispanic teens was 50% higher than LBW among white non-Hispanic teens. Among women 20 years and older, the percentage of births to black non-Hispanics that were low birthweight was 84.4% greater than the percentage among whites that were low birthweight.

Table 14.
Percent Low Birthweight[1] Births by Mother's Age
Massachusetts and United States: 1998

Mother's Age	MA %[2]	U. S. %[2]
All Ages	7.0	7.6
20+ Years	6.8	7.3
< 20 Years	8.9	9.6
15-19 Years	8.8	9.5
< 15 Years	15.2	13.1

Source: Massachusetts data from Registry of Vital Records and Statistics, MDPH, BHRSE, 1998. U.S. data from the National Center for Health Statistics (NCHS), 1998.

1 Low birthweight: < 2,500 grams or 5.5 pounds.

2 Percentages are based on the total number of births in each category for which birthweight is known.

- In 1998, the percentage of low birthweight (LBW) among births to Massachusetts women of all ages was lower than the national average (7.0% vs. 7.6%).

- Broken out by age, the 1998 Massachusetts percentage LBW among births to women was lower among all age categories excluding younger teen mothers. For mothers under age 15, the Massachusetts percentage LBW was 15.2%, while the national percentage LBW for mothers in that age group was 13.1%.

Table 15.
Low Birthweight[1] among Teen Births
by Level of Prenatal Care[2, 3] and Mother's Race/Hispanic Ethnicity
Massachusetts: 1998

Mother's Race/ Ethnicity	Level of Prenatal Care								
	Adequate			Intermediate			Late/None		
	Births	Low Birthweight		Births	Low Birthweight		Births	Low Birthweight	
	N[4]	N	%	N[4]	N	%	N[4]	N	%
< 20 Years	3,634	318	8.8	1,660	142	8.6	563	55	9.8
White*	1,930	144	7.5	776	53	6.8	222	16	7.2
Black*	452	51	11.3	192	19	9.9	95	10	10.5
Hispanic	1,051	98	9.3	523	51	9.8	189	24	12.7
Asian*	67	9	13.4	96	15	15.6	22	2	**
Other*	132	16	12.1	73	4	**	33	3	**
Unknown	2	0	0.0	0	0	0.0	2	0	0.0

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

* Non-Hispanic

** Calculations based on fewer than 5 events are excluded.

[1] Low birthweight: < 2,500 grams or 5.5 pounds.

[2] Adequacy of Prenatal Care is determined by a calculation that combines trimester of prenatal care registration with the number of prenatal care visits and adjusts for gestational age. (See Glossary for further explanation)

[3] Due to a change in 1996 in the collection of information on Adequacy of Prenatal Care, caution should be used when comparing these data over time. (Refer to Foreword for an explanation of these changes)

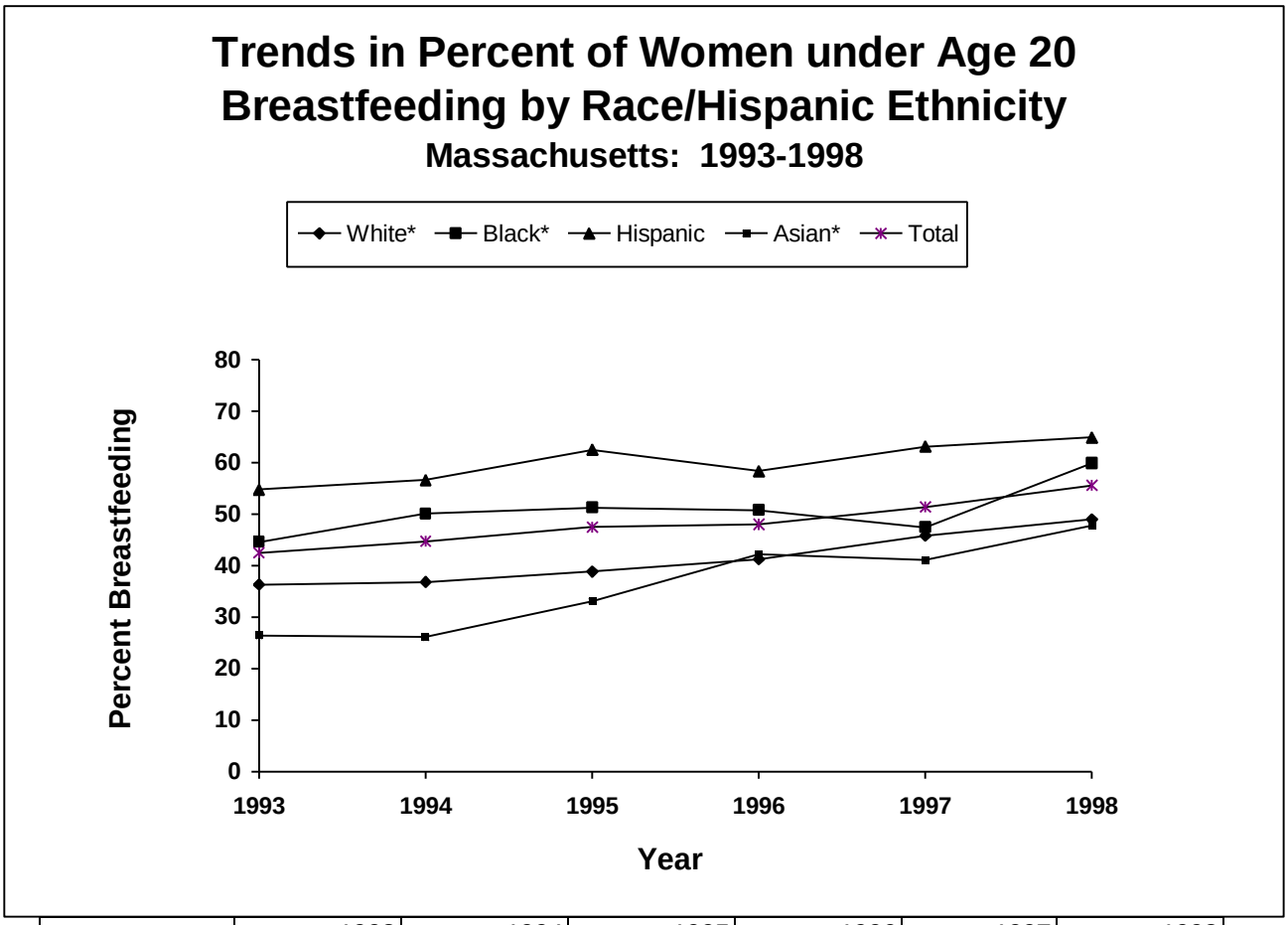
[4] Births with unknown birthweight and/or unknown adequacy of prenatal care were excluded.

- Teen mothers (< 20 years of age) with no or late prenatal care were more likely to deliver with low birthweight (9.8%) than those who received adequate (8.8%) or intermediate care (8.6%). Those who received intermediate prenatal care were only slightly less likely to have low birthweight births (8.6%) compared with those who received an adequate level of care (8.8%).

- Black non-Hispanic teens with adequate prenatal care had a substantially higher percentage of low birthweight (11.3%) than white non-Hispanic teens with adequate prenatal care (7.5%).

- Hispanic teens were the only group to exhibit increasing returns in decreased low birthweight as the level of prenatal care improved. The other race/Hispanic ethnic groups did not exhibit a noticeable relationship between level of prenatal care and low birthweight.

Figure 8.



	1993	1994	1995	1996	1997	1998
White*	36.3	36.8	38.8	41.3	45.8	49.0
Black*	44.6	50.1	51.3	50.8	47.4	59.9
Hispanic	54.8	56.6	62.5	58.4	63.1	64.9
Asian*	26.4	26.1	33.1	42.2	41.1	47.8
Total	42.5	44.7	47.5	48.0	51.4	55.6

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.
* Non-Hispanic
[1] Mother was breastfeeding or intending to breastfeed at the time the birth certificate was completed.

- From 1993 to 1998 the total percentage of teen mothers breastfeeding or intending to breastfeed has increased 30.8% for all race and Hispanic ethnicity groups. Between 1997 and 1998, the overall rate of breastfeeding or intention to breastfeed grew from 51.4% to 55.6%. The most dramatic change occurred among black non-Hispanic teen mothers, increasing from 47.4% in 1997 to 59.9% in 1998.

- Hispanic teen mothers continued to have the highest percentage of breastfeeding or intention to breastfeed in 1998 (64.9%). This percentage has consistently remained higher than 50% over the last six years. Asian teen mothers have shown the largest increase from 26.4% to 47.8% over the last six years.

Table 16.
Prenatal Care and Birth Characteristics By Mother's Age and Race/Hispanic Ethnicity
Massachusetts: 1998

Mother's Race/Ethnicity	Birthweight[1]				Prenatal Care				C-Section		Breastfeeding[4]	
	Very Low		Low		Adequate Care[2,3]		First Trimester					
	N	%[5]	N	%[5]	N	%[5]	N	%[5]	N	%[5]	N	%[5]
All Ages[6]	1,070	1.4	5,655	7.0	64,616	80.1	68,300	84.4	16,975	19.8	56,591	67.9
20 + Years	957	1.3	5,132	6.8	60,982	81.2	64,411	85.7	16,243	21.5	53,357	72.2
< 20 Years	113	1.9	523	8.9	3,634	62.0	3,889	66.4	732	12.4	3,234	55.6
White*	53	1.8	217	7.3	1,930	65.9	2,042	69.7	397	13.4	1,411	49.0
Black*	18	2.4	83	11.1	452	61.2	492	66.5	87	11.7	442	59.9
Hispanic	33	1.9	174	9.8	1,051	59.6	1,125	63.8	206	11.6	1,150	64.9
Asian*	5	2.7	26	14.1	67	36.2	85	45.9	11	5.9	88	47.8
Other*	4	**	23	9.6	132	55.5	143	59.8	31	13.0	142	59.4
Unknown	0	0.0	0	0.0	2	**	2	**	0	0.0	1	**

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

* Non-Hispanic

** Calculations based on fewer than 5 events are excluded.

1 Very low birthweight: < 1,500 grams or 3.3 pounds. Low birthweight: < 2,500 grams or 5.5 pounds.

2 Adequacy of Prenatal Care is determined by a calculation that combines trimester of prenatal care registration with the number of prenatal care visits and adjusts for gestational age. (See Glossary for further explanation)

3 Due to changes, beginning in 1996, in the collection of information on Adequacy of Prenatal Care, caution should be used when comparing these data over time. (Refer to Foreword for an explanation of these changes)

4 Mother was breastfeeding or intending to breastfeed at the time the birth certificate was completed.

5 Percentages are based on total number of births within each category when birthweight, prenatal care, cesarean section or breastfeeding information is known.

6 "All Ages" includes mothers of unknown age.

- In 1998, very low birthweight was still marginally more frequent among births to teens (<20 years) than among births to older women (1.9% vs.1.3%). Among teen births, very low birthweight was highest among births to Asian mothers (2.7%). Since the number of births to Asian teens (<20 years old) was relatively small, this value should be interpreted with caution.

- As in previous years, women under 20 were less likely than women over 20 to receive adequate prenatal care (62.0% vs. 81.2%), as well as prenatal care during the first trimester (66.4% vs. 85.7%).

- A higher percentage of white non-Hispanic teens received adequate prenatal care (65.9%) compared with other race/Hispanic ethnicity groups. Asian teen mothers had the lowest percentage (36.2%). Similarly, 69.7% of white non-Hispanic teens began prenatal care during the first trimester compared to only 45.9% of Asian teen mothers.

- The difference between the percentages of Asian and white non-Hispanic teen mothers receiving adequate prenatal care increased from 1997 to 1998. In 1997, the percentage of white non-Hispanic teen mothers receiving adequate prenatal care was 55.6% higher than the percentage among Asian mothers (63.8% vs. 41.0%); the figure swelled to an 82.0% difference in 1998 (65.9% vs. 36.2%) (1997 data not shown).

- C-Sections were less common among teen mothers than adult mothers (12.4% vs. 21.5%). The percentage for both populations rose slightly from the previous year (from 11.6% to 12.4% for teen mothers and from 20.4% to 21.5% for adult mothers). (1997 data not shown).

- Breastfeeding or an intention to breastfeed, was reported by over half of the teen mothers (55.6%) compared with nearly three-quarters (72.2%) of older mothers. Both segments rose slightly from the 1997 figures as women under 20 were 8.2% more likely to breastfeed and women over 20 were 4.3% more likely to breastfeed. (1997 data not shown).

Table 17.
Births by Gestational Age, Mother's Age, and Mother's Race/Hispanic Ethnicity
Massachusetts: 1998

Mother's Age and Gestational Age[1] (weeks completed)	White*		Black*		Hispanic		Asian*		Other*		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
20 Years and Older	58,810	100.0	4,804	100.0	6,890	100.0	3,562	100.0	1,291	100.0	144	100.0	75,501	100.0
< 37 weeks	4,144	7.0	553	11.5	576	8.4	236	6.6	104	8.1	7	4.9	5,620	7.4
37-42 weeks	54,259	92.3	4,230	88.1	6,287	91.2	3,307	92.8	1,181	91.5	54	37.5	69,318	91.8
43 + weeks	81	0.1	7	0.1	20	0.3	8	0.2	1	**	0	0.0	117	0.2
Unknown	326	0.6	14	0.3	7	0.1	11	0.3	5	0.4	83	57.6	446	0.6
Less than 20 Years	2,953	100.0	745	100.0	1,775	100.0	185	100.0	239	100.0	5	100.0	5,902	100.0
< 37 weeks	207	7.0	80	10.7	167	9.4	21	11.4	21	8.8	0	0.0	496	8.4
37-42 weeks	2,726	92.3	662	88.9	1,600	90.1	164	88.6	218	91.2	2	**	5,372	91.0
43 + weeks	7	0.2	2	**	6	0.3	0	0.0	0	0.0	0	0.0	15	0.3
Unknown	13	0.4	1	**	2	**	0	0.0	0	0.0	3	**	19	0.3

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

* Non-Hispanic **Calculations based on fewer than 5 events are excluded.

[1] Clinical estimate of the number of weeks of pregnancy completed as estimated by the attendant at birth or the postnatal physician. The definition of normal gestational age has been revised for 1998 report (see Technical Notes).

[2] Percentages are based on column totals.

- The incidence of preterm birth (< 37 weeks gestation) continued to be higher among teen births than among births to older women (8.4% vs. 7.4%). The gap, however, between the two groups continued to close from 1.6% (1997) to 1.0% (1998), as a function of a decline in the percentage of preterm births to teens and an increase in the percentage of preterm births to older mothers (1997 data not shown).

- The percentage of preterm births was higher among teen mothers for Asians and Hispanics compared to adult mothers (11.4% compared to 6.6% for Asians and 9.4% compared to 6.6% for Hispanics). Asian teen mothers had the highest percentage of preterm births among the race/Hispanic ethnicity groups (11.4%), followed by births to black non-Hispanic teen mothers (10.7%). White non-Hispanic teen mothers had the lowest percentage of preterm delivery (7.0%).

Table 18.
Trends in Infant Mortality Rates[1] by Mother's Age and Race/Hispanic Ethnicity
Massachusetts: 1992-1997[2]

Mother's Age	White*		Black*		Hispanic		Asian*		Other/Unk		Total	
	N[3]	Rate	N[3]	Rate	N[3]	Rate	N[3]	Rate	N[3]	Rate	N[3]	Rate
1992												
20+	343	5.4	89	15.9	41	6.1	18	5.8	16	16.0	507	6.3
<20	32	9.0	20	18.9	19	11.0	0	0.0	2	**	73	11.0
1993												
20+	318	5.1	68	12.6	47	7.3	10	3.2	11	11.1	454	5.8
<20	25	7.2	14	14.0	23	12.7	2	**	0	0.0	64	9.7
1994												
20+	293	4.8	73	13.9	37	5.7	14	4.4	15	15.2	432	5.6
<20	33	10.0	8	8.0	20	10.3	1	**	2	**	64	9.7
1995												
20+	228	3.8	55	11.0	48	7.6	15	4.6	13	12.7	359	4.8
<20	25	7.8	7	8.1	15	8.7	0	0.0	1	**	48	7.9
1996												
20+	239	4.1	55	11.8	31	5.1	10	2.9	14	9.8	349	4.7
<20	21	7.1	10	12.3	13	7.5	1	**	2	**	47	8.0
1997												
20+	251	4.3	46	9.6	43	6.2	11	3.1	18	12.5	369	4.9
<20	14	4.7	11	14.8	12	6.8	0	0.0	4	**	41	6.9

Source: Registry of Vital Records and Statistics, MDPH, BHRSE: 1992-1997.

* Non-Hispanic

** Calculations based on fewer than 5 events are excluded.

[1] Age and race-specific infant mortality rate: number of infant deaths per 1,000 live births in each age group (see Technical Notes for further explanation).

[2] 1997 is the last year data were available for this analysis. (See Technical Notes for further explanation of age-specific infant mortality)

[3] "N" refers to the number of infants born in that year who died before their first birthday.

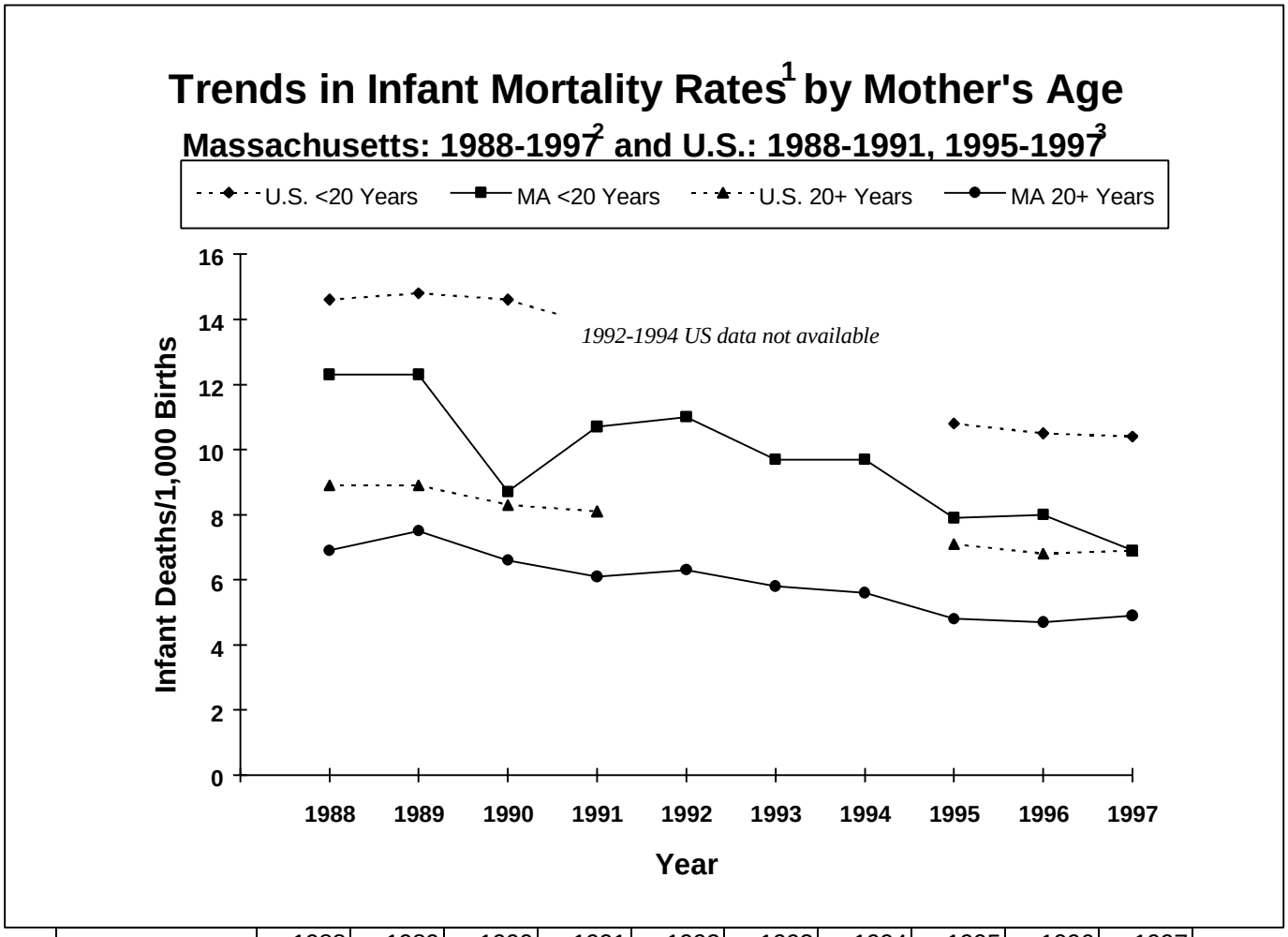
- As in previous years, the 1997 infant mortality rate (IMR) was higher among births to teen mothers compared to births to adult mothers. This difference, however, shrank considerably between 1996 and 1997, as the IMR among births to adults rose slightly from 4.7 to 4.9 deaths per 1,000 live births, while the IMR for births to teens dropped from 8.0 to 6.9.

- In 1997, the IMR was higher among births to teen mothers compared to births to adult mothers among all race/Hispanic ethnicity categories excluding Asians where no infant deaths among births to teen mothers were reported.

- The IMR among black non-Hispanic teens rose from 1994 to 1997. The IMR was lower among births to teen mothers compared to births to adult mothers for black non-Hispanic women. Between 1995 and 1997, the IMR among births to black non-Hispanic teen mothers has risen 82.7% from 8.1 to 14.8 deaths per 1,000 live births. However, the number of infant deaths to black non-Hispanic teen mothers is small and the IMRs have fluctuated greated since 1992. Changes over time should be interpreted with caution.

- IMR among births to teen mothers dropped for white non-Hispanic women in 1997. The drop among white non-Hispanic teen mothers was considerable as IMR fell from 7.1 in 1996 to 4.7 in 1997.

Figure 9.



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
U.S. <20 Years	14.6	14.8	14.6	13.8	N/A	N/A	N/A	10.8	10.5	10.4
MA <20 Years	12.3	12.3	8.7	10.7	11.0	9.7	9.7	7.9	8.0	6.9
U.S. 20+	8.9	8.9	8.3	8.1	N/A	N/A	N/A	7.1	6.8	6.9
MA 20+	6.9	7.5	6.6	6.1	6.3	5.8	5.6	4.8	4.7	4.9

Source: MA data: Registry of Vital Records and Statistics, MDPH, BHRSE, 1988-1997; U.S. data: National Center for Health Statistics, 1988-1991 and 1995-1997.

[1] Age-specific infant mortality rate: number of infant deaths per 1,000 live births to mothers in each age group (see Glossary for further explanation).

[2] 1997 is the latest year data were available for this analysis (see Technical Notes for further explanation).

[3] U.S. data not available for 1992-1994.

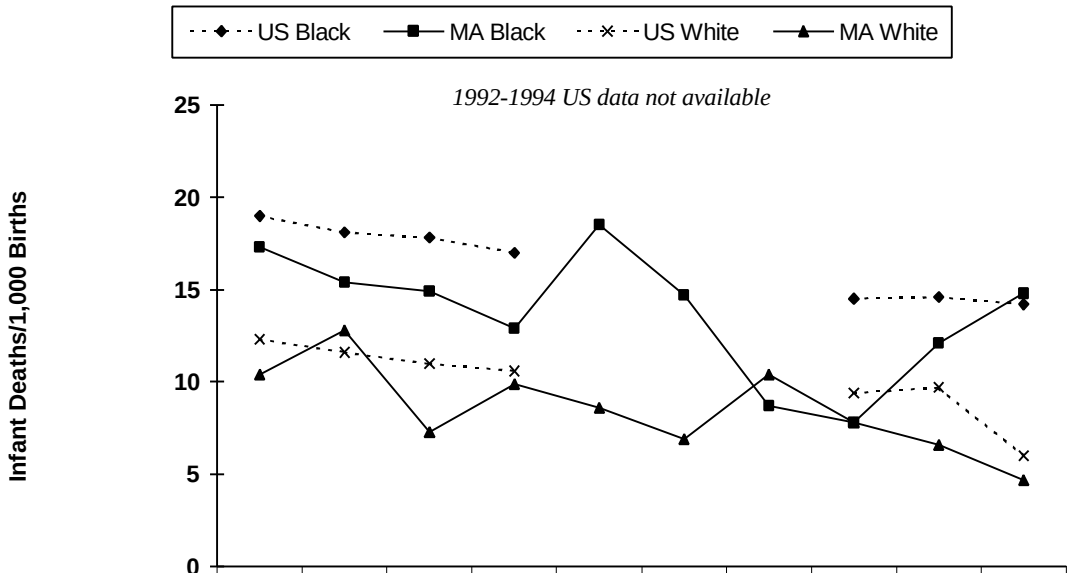
- In 1997, the infant mortality rate (IMR) in Massachusetts remained much lower than the national average among both teen and adult mothers. The IMR among Massachusetts teen births in 1997 was 33.7% lower than the IMR among U.S. teen births (6.9 vs. 10.4 deaths per 1,000 live births). Similarly, the IMR among Massachusetts adult births was 29.0% lower than the national IMR among older mothers (4.9 vs. 6.9 deaths per 1,000 live births).

- The adult IMR in both Massachusetts and the U.S. changed little between 1996 and 1997. Among teen mothers, however, the U.S. IMR remained stable, while the Massachusetts IMR dropped 13.4% between 1996 and 1997 (8.0 vs. 6.9 deaths per 1,000 live births).

Figure 10.

Trends in Infant Mortality Rates[1] among Women under Age 20 by Race[2]

Massachusetts: 1988-1997[3] and US: 1988-1991, 1995-1997[4]



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
US Black	19.0	18.1	17.8	17.0				14.5	14.6	14.2
MA Black	17.3	15.4	14.9	12.9	18.5	14.7	8.7	7.8	12.1	14.8
US White	12.3	11.6	11.0	10.6				9.4	9.7	6.0
MA White	10.4	12.8	7.3	9.9	8.6	6.9	10.4	7.8	6.6	4.7

Source: Massachusetts data from Registry of Vital Records and Statistics, MDPH, BHRSE: 1988-1997. U.S. data from the National Center for Health Statistics, 1988-1991 and 1995-1997.

[1] Age and race-specific infant mortality rate: number of infant deaths per 1,000 live births to mothers in each age-race group (see Glossary for further explanation).

[2] The white and black race categories include Hispanics.

[3] 1997 is the latest year data were available for this analysis. (See Technical Notes for further explanation.)

[4] U.S. data not available for 1992-1994.

- The IMR for births to black teen mothers in Massachusetts has nearly doubled since 1995. During the same period, the IMR among births to black teen mothers nationally has remained fairly stable. The IMR among births to black teen mothers in Massachusetts was slightly higher in 1997 than the national IMR for that population (14.8 vs. 14.2 deaths per 1,000 live births).

- While the IMR among births to white mothers for the U.S. dropped more sharply between 1996 and 1997 than the IMR among births to white mothers in Massachusetts, the rate in Massachusetts remained lower than the national rate (4.7 vs. 6.0 deaths per 1,000 live births).

Table 19.
Infant Mortality Rates[1] by Low Birthweight[2] and Mother's Age
Massachusetts: 1997[3]

	<1500g		1500-2499g		<2500g		2500+g	
Mother's Age	**N[4]**	**IMR**	**N[4]**	**IMR**	**N[4]**	**IMR**	**N[4]**	**IMR**
20 + Years	234	221.4	33	7.8	267	50.4	85	1.2
< 20 Years	25	231.5	3	6.5	28	49.0	9	1.7

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1997.

[1] Age and birthweight-specific infant mortality rate: number of infant deaths per 1,000 live births in each age group (see Glossary for further explanation).

[2] Low birthweight: < 2,500 grams or 5.5 pounds.

[3] 1997 is the latest year data were available for this analysis. (See Technical Notes for further explanation.)

[4] "N" refers to the number of deaths occurring in that age and birthweight category.

- The infant mortality rate (IMR) among normal birthweight infants (2,500 grams or more) was slightly higher for teen mothers as compared to adult mothers (1.7 vs. 1.2 deaths per 1,000 live births). This difference, however, narrowed greatly between 1996 and 1997 due to a drop in the teen IMR. In 1996, the IMR among births to teen mothers was 3.1, compared to 1.7 among births to teen mothers in 1997 (1996 data not shown).

- The IMR increased dramatically as birthweight declined among both teen and adult mothers in 1997. The IMR among very low birthweight births (<1,500 grams) for adult mothers was 221.4 deaths per 1,000 live births compared to 7.8 among moderately low birthweight births (1,500 to 2,499 grams). Similarly, among teen mothers, the IMR for very low birthweight births was 231.5 deaths per 1,000 live births compared to 6.5 for moderately low birthweight births.

- The IMR among births to teen mothers was higher than the IMR among births to adult mothers for very low birthweight births (231.5 vs. 221.4 deaths per 1,000 live births). For moderately low birthweight births, however, the IMR was higher among older mothers (7.8 vs. 6.5 deaths per 1,000 live births). Among all low birthweight births (<2,500 grams) in 1997, the IMR for births to teen mothers was slightly lower than the IMR for births to adult mothers (49.0 vs. 50.4 deaths per 1,000 live births).

Table 20.
Trends in Neonatal and Post Neonatal Mortality Rates[1] by Mother's Age Massachusetts: 1992-1997[1]

Year	Mother's Age	Neonatal[2] Mortality		Post Neonatal[3] Mortality		Total Infant[4] Mortality	
		N[5]	Rate	N[5]	Rate	N[5]	Rate
1992	**20+**	372	4.6	130	1.6	502	6.2
	<20	52	7.8	21	3.2	73	11.0
1993	**20+**	331	4.2	123	1.6	454	5.8
	<20	44	6.7	20	3.0	64	9.7
1994	**20+**	309	4.0	122	1.6	431	5.6
	<20	47	7.2	17	2.6	64	9.7
1995	**20+**	263	3.5	96	1.3	359	4.8
	<20	29	4.7	19	3.1	48	7.9
1996	**20+**	252	3.4	95	1.3	347	4.7
	<20	28	4.8	19	3.2	47	8.0
1997	**20+**	292	3.9	77	1.0	369	4.9
	<20	35	5.9	6	1.0	41	6.9

Source: Registry of Vital Records and Statistics, MDPH, BHRSE: 1991-1997.

[1] 1997 is the latest year data were available for this analysis. (See Technical Notes for further explanation)

[2] Neonatal: less than 28 days (see Glossary).

[3] Post neonatal: 28-364 days (see Glossary).

[4] Age-specific infant mortality rate: number of infant deaths per 1,000 live births in each age group (see Glossary for further explanation).

[5] "N" refers to the number of deaths occurring in that year.

- The neonatal mortality rate among births to teen mothers remained higher in 1997 than the rate among births to adult mothers (5.9 vs. 3.9 deaths per 1,000 live births). The rate for teen mothers in 1997, at 5.9, was higher than the 1996 rate of 4.8 for that group.

- Post neonatal mortality rates were the same in 1997 for adult and teen mothers (1.0 death per 1,000 live births). The rate among births to teen mothers declined greatly, from 3.2 in 1996 to 1.0 in 1997.

Table 21.
Maternal Smoking[1, 2] by Mother's Age and Race/Hispanic Ethnicity
Massachusetts: 1998

Mother's Race/Ethnicity	< 20 Years			20+ Years		
	Births N[3]	Smokers N	%	Births N[3]	Smokers N	%
Total	5,902	1,246	21.1	75,500	8,127	10.8
White*	2,953	940	31.8	58,809	6,908	11.7
Black*	745	80	10.7	4,804	462	9.6
Hispanic	1,775	169	9.5	6,890	567	8.2
Asian*	185	14	7.6	3,562	39	1.1
Other*	239	43	18.0	1,291	151	11.7
Unknown	5	0	0.0	144	1	**

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

* Non-Hispanic

** Calculations based on 1-4 events are excluded.

[1] Any amount of cigarette smoking by mother during pregnancy.

[2] Maternal smoking is self-reported by mothers, usually following the birth of their child, and as such these data should be interpreted cautiously. Self-reported data may be biased, artificially lowering smoking prevalence.

[3] Cases with unknown smoking status were excluded.

- As in 1997, teen mothers reported much higher rates of smoking during pregnancy in 1998 than adult mothers (21.1% vs. 10.8%) did. Between 1997 and 1998, both segments displayed a decreased prevalence of smoking during pregnancy. The percentage of teen mothers who smoked during pregnancy decreased a very small amount from 21.4% in 1997 to 21.1% in 1998, while the prevalence of adult women who smoked during pregnancy decreased from 11.6% in 1997 to 10.8% in 1998. (1997 data not shown.)

- Among teen mothers, white non-Hispanic women had the highest prevalence of smoking (31.8%), dramatically higher than their adult counterparts (11.7%). Asian teen mothers had the lowest prevalence of smoking at 7.6%.

- From 1997 to 1998, the smoking rate for Blacks, Hispanics, and Asians decreased among both teen and adult mothers. (1997 data not shown.)

Table 22.
Low Birthweight by Mother's Age, Smoking[1, 2] Status and Race/Hispanic Ethnicity
Massachusetts: 1998

	Smokers			Non-Smokers		
	Births	LBW		Births	LBW	
Mother's Age	N[3]	N	%[4]	N[3]	N	%[4]
20 Years and Older	8,127	843	10.4	67,079	4,271	6.4
White*	6,908	654	9.5	51,904	3,036	5.8
Black*	462	85	18.4	4,342	488	11.2
Hispanic	567	81	14.3	6,323	418	6.6
Asian*	37	4	**	3,526	250	7.1
Other/Unknown*	152	19	12.5	1,283	79	6.2
< 20 Years	1,246	110	8.8	4,656	413	8.9
White*	940	71	7.6	2,013	146	7.3
Black*	80	8	10.0	665	75	11.3
Hispanic	169	27	16.0	1,606	147	9.2
Asian*	14	1	**	171	25	14.6
Other/Unknown*	43	3	**	201	20	10.0

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

* Non-Hispanic

** Calculations based on 1-4 events are excluded.

[1] Any amount of smoking cigarettes by mother during pregnancy.

[2] Maternal smoking is self-reported by mothers, usually following the birth of their child, and as such these data should be interpreted cautiously. Self-reported data may be biased, artificially lowering smoking prevalence.

[3] Cases with unknown smoking status or birthweight were excluded.

[4] Percentage of low birthweight births (<2,500 grams) to smoking or non-smoking mothers.

- For adult mothers, low birthweight births increased with smoking during pregnancy. However, among teens, low birthweight births decreased with smoking during pregnancy. Among teens, low birthweight births occurred less frequently among mothers who smoked during pregnancy for all race/Hispanic ethnic groups excluding Hispanic women. (The number of non-white teen smokers is very small, and race-specific teen smoking rates among non-whites should be interpreted cautiously.)

- In 1998, the percentage of low birthweight births among Hispanic teen smokers was 2.1 times greater than among white non-Hispanic smoking teens. The percentage of low birthweight births among non-smoking Hispanic teens was 1.3 times greater than non-smoking white non-Hispanic teens.

- Low birthweight births among smokers and non-smokers varied across race/ethnicity. The percentage of low birthweight births among adult smokers was 38.5% higher (10.4% vs. 6.4%) than among adult non-smokers. Among teens, the percentage of low birthweight births was 1.1% lower (8.8% vs. 8.9%) for non-smokers compared with smokers.

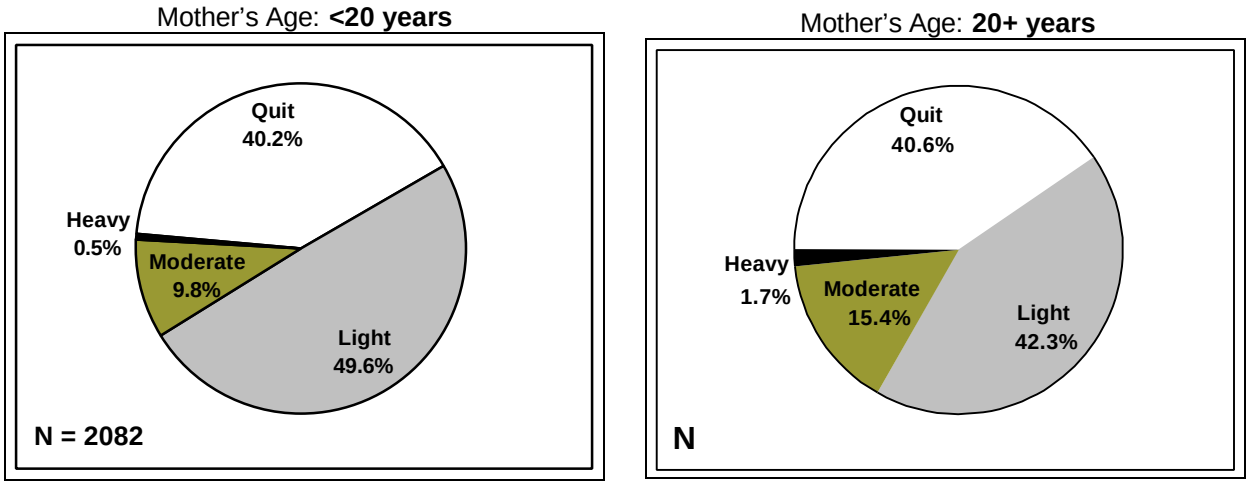
- For white non-Hispanic adult smokers, low birthweight births were 38.9% higher with smokers than non-smokers (9.5% vs. 5.8%), whereas low birthweight births were 3.9% higher for white non-Hispanic smokers than non-smokers (7.6% vs. 7.3%).

- For women over 20 who smoked the number of low birthweight births remained constant from 1997 to 1998, while low birthweight births to teen smokers from 1997 to 1998 decreased 24.1% (from 11.6% to 8.8%).

Figure 11.
Smoking Level[1] During Pregnancy by Mother's Age and Smoking Level Prior to Pregnancy
Massachusetts: 1998

Smoking Status: Prior to Pregnancy				
Mother's Age	<20 years		20+ years	
	N	%	N	%
Total	2,082	100.0	13,476	100.0
Light	1,044	50.1	6,018	44.7
Moderate	884	42.5	6,207	46.1
Heavy	154	7.4	1,251	9.3
Smoking Status: During Pregnancy				
Mother's Age	<20 years		20+ years	
	N	%	N	%
Total	2,082	100.0	13,378	100.0
Quit	836	40.2	5,434	40.6
Light	1,032	49.6	5,660	42.3
Moderate	203	9.8	2,062	15.4
Heavy	11	0.5	222	1.7

Smoking Status During Pregnancy among Mothers Under 20 and Over 20 Who Smoked Prior to Pregnancy



Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

[1] Daily use: Light = 1-10 cigarettes, Moderate = 11-20 cigarettes, Heavy = 21+ cigarettes

- Overall, the fewer cigarettes mothers smoked *prior* to pregnancy, the more likely they were to quit or reduce their level of smoking *during* pregnancy. This pattern was found among both teen and adult groups.

- Among teen mothers who were smokers prior to pregnancy (smoked 1-10 cigarettes per day), 40.2% quit smoking during pregnancy, 49.6% maintained light smoking and 92.9% of heavy smokers either decreased their level of smoking or quit.

- In 1998, 77.0% of teen mothers who were moderate smokers prior to pregnancy either quit or reduced their consumption, compared with 66.6% of adult mothers in the same category. Among moderate teen smokers, 44.2% reduced their smoking status to light and 40.1% quit, while 38.0% of moderate adult smokers reduced to light smoking and 41.6% quit (data not shown).

- Among moderate smokers, the percentage of teen and adult mothers quitting during pregnancy rose between 1997 and 1998. Among teen mothers, the percentage quitting increased from 30.2% in 1997 to 40.1% in 1998, and among adult mothers, the percentage quitting rose from 27.7% in 1997 to 41.6% in 1998 (data not shown).

- Older mothers (ages 20 and older) who were heavy smokers prior to pregnancy (smoked 21 or more cigarettes per day) were less likely to quit or reduce their smoking levels compared with heavy smoking teen mothers. Among the heavy smoking mothers, 92.9% of teens either quit or reduced their smoking levels to light compared with 82.3% of older mothers. Similarly, 17.7% of older, heavy smoking mothers remained heavy smokers during pregnancy, as opposed to only 7.1% of teen, heavy smoking mothers.

Table 23.
Expected Educational Attainment among Teen Mothers by Race/Hispanic Ethnicity
Massachusetts: 1998

Community	Behind Grade Level[1]	
	Number	Percent
Total	1,833	31.1
White*	831	28.2
Black*	147	19.8
Hispanic	735	41.4
Asian*	53	28.6
Other	66	27.6
Unknown	1	**

Source: Registry of Vital Records and Statistics, MDPH, BHRSE, 1998.

* Non-Hispanic

** Calculations based on fewer than five events are excluded.

1 "Behind Grade Level" is defined as two or more grades behind the maximum expected age for a grade at the time of delivery. (See Technical Notes and Glossary for further explanation.)

- In 1998, 31.1% of births to teens (< 20 years of age) were to women who were behind their expected grade level at school.

- Among race/Hispanic ethnicity groups, Hispanic teen mothers were most likely to be behind their expected grade level (41.4%), followed by Asian teen mothers (28.6%) and white non-Hispanic teen mothers (28.2%).